NOTES ON AUSTRALIAN MARINE ALGÆ, ii.*

Descriptions of Four New Species.

By A. H. S. Lucas, M.A., B.Sc.

(Plate vi.)

Laurencia Lamour.

Laurencia infestans, sp.nov.

Habitat.—Covering large areas of the surface of the fronds of *Ecklonia radiata* var. *exasperata*, and extending around the coarse spinules of the frond. Manly, N. S. Wales.

Attachment simple at the base of the frond, aided by nearly sessile discs growing from the under surface of the creeping branches and branchlets. Discs circular, of diameter greater than that of the branch, formed of very narrow, colourless, radiating cells. *Habit* simple (young) or with few main branches diverging from the attachment, some erect, others horizontally creeping. Extent of the frond, about 1 cm. Branches pinnate, bearing alternate patent ramuli, proceeding nearly at right angles to the ramus. The ramuli for the most part constricted a little above the base, linear, obtuse, the apices almost truncate, with shallow, median foveola. Erect branches rounded, creeping, compressed. *Structure:* in cross-section two strata of cells, cortical of smaller, densely coloured, rounded cells, interior of larger, oblong-angular, less deeply coloured cells: all the cells set in gelatine. All the cells are elongated in axial direction. *Colour* dull red, becoming darker on drying. *Tetrasporangia* immersed in the apical region of the ramuli, rarely extending

* Continued from Vol. xxxviii., 1913, p.60.

beyond the apical half of the ramulus, triangularly divided, rounded, large when mature, maturing in acropetal succession. *Cystocarps* ovate-spherical, arising as modification of apex of ramulus, which may be terminal or lateral; producing large, pear-shaped, deeply coloured spores at the extremities of the colourless filaments, which radiate from a basal placenta; surrounded by a cellular pericarp, with apical opening.

Frons nana ad 1·5 cm. diam., ramis a disco basali divergenti bus primo erectis, mox horizontaliter repentibus, compressis, huc et illuc disco ad frondem hospitis affinis. Ramuli valde patentes pinnati obtusi. Tetrasporangia in superiore regione ramuli immersa, triang. divisa, ampla. Cystocarpia ovato-spherica transformatione ramuli. Color fusco-ruber, obscurior exsiccatione. Substantia cartilaginea, frons chartæ vix adheret. Frondes gregariæ tegentes frondem hospitis. Rami primarii et ramuli tetrasporangiferi usque ad 430μ, ramuli steriles angustiores.

This is a dwarf but typical *Laurencia*. In size it appears to equal *L. pygmæa* Weber de Bosse, from Diego Garcia (Percy Sladen Expedition, 1905), described in Trans. Linn. Soc. London, Vol. xvi., Part 3, p. 286, 1914. Our plant differs from *L. pygmæa* in being strongly compressed, the branches spreading over the *Ecklonia* frond almost like hoar-frost crystals on a window-pane, attached by circular discs at frequent intervals. The compressed branches are considerably wider than those of *L. pygmæa* (250μ), and the tetrasporangiferous ramuli are about as wide as the primary branches. *L. infestans* clearly belongs to the Section *Obtusæ* of the genus.

Falkenbergia Schmitz.

Falkenbergia olens, sp.nov.

Structure of the genus. No cystocarps or tetrasporangia observed. Free-floating in loose, intricate masses, more or less globular, but of irregular boundary, up to 2 cm. at most in diameter. Doubtful if the tangle of branches of each mass belonged to one plant, or had been brought together by the

motion of the water. Examples of complete plants received later showed that the plant has the habit of the smaller species of *Sphacelaria*.

Diameter of rami to 40μ. On examining specimens of *F. vagabunda* and *F. rufolanosa* in Harvey's Alg. Austr. Exsicc., the diameter of the rami of the former reached 36μ at most, that of the latter 27μ.

Our form seems to be much stouter than *F. rufolanosa*, which it closely resembles in habit, and to be rather stouter than *F. vagabunda*, which has a much denser habit and occurs in smaller, non-distinct globes. The true Australian forms are all much slenderer than *F. Hillebrandii* of the Atlantic and Mediterranean (60-70μ).

F. oleus is of a dull red colour when living, and gives a beautiful rose-colour to the superincumbent water in which it is kept. On drying from formalin, it becomes a brownish-purple, by no means so brown as the mounted specimens of *F. vagabunda*. Drying naturally it is quite red. *F. rufolanosa* dries a rosy red.

Great quantities of this weed, called locally the Red Weed, were brought in by the sea at Port Macquarie, and collected disastrously in heaps on the oyster beds. It seemed to decompose rapidly, evolving much gas and giving out a vile stench. In consequence, the oysters were killed and great damage was done to the local industry. Nothing is known of the habitat in which the plant grows, but it seems to be certain that it must grow on water plants in fairly deep water. The plague occurs at irregular intervals, not appearing every year. Since the Red Weed obtrudes itself so forcefully on the public notice, it seems useful to give it a scientific name.

Falkenbergia vagabunda (Harv.) Falk., was collected by Harvey at Eaglehawk Neck, Tasmania, free floating in the waves, and by J. Bracebridge Wilson off the Victorian Coast adhering to other algæ. *F. rufolanosa* (Harv.) Falk., was found growing on other plants in King George's Sound, W.A. It is interesting to meet with an Eastern Coast representative of this singular genus.

Polysiphonia Greville.

Polysiphonia zostericola, sp.nov.

Fronds gregarious, forming a thick fringe to the leaves of *Zostera*, not intricate, slender, to 2·5 cm. long. Attached by small basal disc, branching below dichotomous, above more pinnate. The branches come off at an angle of 45°, giving off, at rather long intervals, other like but gradually slenderer branchlets, the last very slender and sometimes secund. Diameter of main axis, 180μ. Basal articuli 1×1, of rami 2×1, of tetrasporangiferous ramelli 1×1. Four pericentral siphons. Substance rather firm, the plants suffering prolonged immersion in water. The frond adheres closely to paper when dry. Colour brownish-purple, darker on drying. Tetrasporangia small, on but little distorted ramelli. Cystocarps nearly sessile, ovate (326×258μ), contracted at base.

Frondes gregariæ secundum margines foliorum zosteræ dense crescentes. Axis disco basali affixus, deorsum dichotomus, sursum magis pinnatus, ramis ad angulum 45° emergentibus. Ramuli distantiis longioribus similiter emergentes, ultimi nonnunquam secundi. Axis primarius 180μ diam. Articuli inferiores 1×1, ramorum 2×1, ramellorum tetrasporangiferorum 1×1. Siphones pericentrales 4. Substantia firma, haud celeriter soluta: frons exsiccata urcte adheret. Tetrasporangia parva in ramulis parum distortis. Cystocarpia fere sessilia, ovata (326-258μ) basi contracta.

Growing abundantly on *Zostera* leaves in salt and in brackish water, Botany and Middle Harbour, N. S. Wales.

This species seems to be near to *P. amphibia* Harv., from New Zealand, which, however, I have not seen, and in which the median articuli are described as nodose, and the axils as patent.

Trichodesmium Ehr.

Trichodesmium scoboideum, sp.nov.

Fasciculis brevissimis ad ·5 mm. longis, siccitate fuscis: trichomatibus rectis ad genicula haud constrictis, apice rotundatis haud attenuatis, 9, 10μ crassis; articulis diametro trichomatis 3 plo-

brevioribus, contentu tenuigranuloso farctis, dissepimentis non aut vix granulatis.

An Oscillatorian consisting of bundles of trichomes, apparently the shortest in the genus, not more than 0·5 mm. long. Colour when preserved in formalin dusky brown. Trichomes straight, not constricted at the genicula, nor attenuated toward the apex, 9 or 10μ thick, the articuli one-third the width of the trichome, with a finely granular content. Apices rounded, hemispherical, without calyptra. Dissepiments nearly or quite clear.

Samples of this alga were forwarded to me by Mr. A. R. McCulloch, of the Australian Museum. I append his notes:—"An alga which I collected at Hope Islands, near Cooktown, in June, 1918. It covered the sea like sawdust everywhere, and formed long streaks or waves across the wind. It was so abundant as to cause smooth patches unbroken by wavelets where it occurred, and was of a light brown colour, the tint apparently varying according to its stage of development. On the Hope Islands it had blown up on the wave-line, and formed felt-like flakes which could be picked up in pieces a foot square and 3-5 mm. thick; the flakes were very dark in colour, and stained the sand-grains settling on them a rich violet. The alga is very buoyant, and causes a muddy appearance in the water as the boat disturbs it. An old hand up that way assured me that its presence was a sign of good weather, and it certainly seems to disappear at the approach of wind and clouds.

I believe this alga was seen by Cook, whose sailors named the region the Sea of Saw-dust on account of its presence. It is of very great importance as a food item to a large number of the reef animals."

The genus *Trichodesmium*, as De Toni writes "A gen. *Oscillatoria* vix distinguendum," is a convenient subgenus at all events, for the inclusion of those Oscillatoriæ which are met with in immense societies floating on the surface of chiefly the equatorial seas They include the species *T. erythræum* Ehr., which gives the red colour, and hence the name, to the Red Sea. In the generic characters a calyptra is included. There is no calyptra

in our species, but, as in *Oscillatoria* proper, forms occur both with and without calyptræ, it seems better to include it with its allies of similar habitat and habit.

The specific name is derived from the Latin *Scobs*, saw-dust.

EXPLANATION OF PLATE VI.

Laurencia infestans, sp.nov.

Fig.1.—The plant.
Fig.2.—A rhizoid expanding into an adhesive disc.
Fig.3.—Cross-section of ramus.
Fig.4.—Ramulus with tetrasporangia.
Fig.5.—Cystocarps.